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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,935	02/09/2006	Johannes Baur	12406148US1P20030565USN	4550
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FISH & RICHARDSON PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			EXAMINER NADAV, ORI	
			ART UNIT 2811	PAPER NUMBER
			NOTIFICATION DATE 12/04/2008	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/567,935	<b>Applicant(s)</b> BAUR ET AL.	
	<b>Examiner</b> Ori Nadav	<b>Art Unit</b> 2811	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 August 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 February 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                      |                                                                   |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                          | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election with traverse of group I in the reply filed on 5/15/2008 is acknowledged. The traversal is on the ground(s) that this application is a national phase entry of a PCT application, and there is no lack of unity in the claimed invention. The examiner agrees that currently there no lack of unity between independent claims 1 and 7. Therefore, the election/restriction requirement is withdrawn.

### ***Drawings***

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the reference character(s) 10 not mentioned in the description.

The drawings are further objected to because:

1. Not all the elements/layers depicted in the drawings include reference characters.
2. Elements 7 and 9, depicted in figure 1A are not recited in paragraph [0037]. Active region element 8, as depicted in figure 1A is pointing to a surface and not to a region.
3. Element 7 is recited in paragraph [0038] with respect to figure 1B but is not depicted in figure 1B.
4. Element 1 depicted in figure 1B but is not described in paragraph [0038].

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification states that the intermixing structure IDEALLY leads to an approximately ergodic distribution of the light in the

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epitaxial layer sequence. There is no support in the specification for the claimed limitations of at least one surface having an intermixing structure that leads to an approximately ergodic distribution of the light in the epitaxial layer sequence, as recited in claims 1 and 7.

Claims 1-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. There is no support in the specification for the claimed limitations an intermixing structure, as recited in claims 1 and 7, in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claimed limitation of an intermixing structure, as recited in claims 1 and 7, is unclear as to which structure is an intermixing structure.

The claimed limitation of at least one surface having an intermixing structure, as recited in claims 1 and 7, is unclear as to how a surface can have a structure.

The claimed limitation of “index of refraction of the structured layer transitions smoothly from the index of refraction of an unstructured region of the structured layer to an index of refraction of an ambient medium next to the structured layer”, as recited in claim 15, is unclear as to what is meant by an unstructured region of the structured layer, how said unstructured region is formed, what is the structural relationship between the structured layer the unstructured region of the structured layer and the ambient medium, and what is meant by index of refraction of the structured layer transitions smoothly from the index of refraction of an unstructured region of the structured layer to an index of refraction of an ambient medium next to the structured layer.

The claimed limitation of “a width and a spacing of mutually adjacent protuberances is less than one wavelength of the electromagnetic radiation emitted from the epitaxial layer sequence”, as recited in claim 16, is unclear as to the structural relationship between these mutually adjacent protuberances and the previously recited mutually adjacent protuberances. It is further unclear as to which element(s) a width is less than one wavelength of the electromagnetic radiation emitted from the epitaxial layer sequence, and how a width and a spacing can be less than one wavelength. Moreover, it is also unclear how the passage of “a width and a spacing of mutually adjacent protuberances is less than one wavelength of the electromagnetic radiation emitted from the epitaxial layer sequence” is related to the passage of “mutually

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adjacent protuberances .... have a lateral grid size that is smaller than one wavelength of an electromagnetic radiation emitted from said epitaxial layer sequence", as recited in independent claim 1.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-19, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshitake et al. (2002/0195609) in view of Yamaguchi et al. (5,324,550) and Endoh (6,007,729).

Yoshitake et al. teach in figure 16 and related text an LED chip comprising

an epitaxial layer sequence 133-138 that is disposed on a carrier element 130, and comprises an electromagnetic-radiation-generating active region, and contains at least one semiconductor layer with at least one surface having an intermixing structure that leads to an approximately ergodic distribution of the light in the epitaxial layer sequence, and

a reflective layer 132 that is disposed on a principal surface of said epitaxial layer sequence facing toward said carrier element and reflects at least a portion of the electromagnetic radiation generated in said epitaxial layer sequence back there-into,

wherein-disposed on a radiation extraction surface of said epitaxial layer sequence facing away from said carrier element is a structured layer 144 containing a material and exhibiting a structure that includes mutually adjacent protuberances that taper away from said radiation extraction surface.

Yoshitake et al. do not state that the structured layer containing a glass material, wherein the mutually adjacent protuberances have a lateral grid size that is smaller than one wavelength of an electromagnetic radiation emitted from said epitaxial layer sequence.

Yoshitake et al. teach that the structured layer containing titanium oxide with a polyimide resin material (see paragraph [0091]).

Endoh teaches in column 8, lines 17-21 that polyimide resin material can be interchanged with glass epoxy resin material.

Yamaguchi et al. teach in column 5, lines 45-48 using titanium oxide containing SOG.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a structured layer containing titanium oxide with glass epoxy resin material or titanium oxide containing SOG, wherein the mutually adjacent protuberances have a lateral grid size that is smaller than one wavelength of an electromagnetic radiation emitted from said epitaxial layer sequence, in Yoshitake et al.'s device in order to improve the characteristics of the device and the processing steps of making the device by using SOG deposition, and in order to use the device in an application which requires specific frequency, respectively.



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Note that substitution of materials is not patentable even when the substitution is new and useful. *Safetran Systems Corp. v. Federal Sign & Signal Corp.* (DC NIII, 1981) 215 USPQ 979.

Regarding claims 2-6 , prior art's device includes the refractive index of said layer lies between the refractive index of a material of a side of said epitaxial layer sequence adjacent said radiation extraction surface and the refractive index of a medium intended as an ambient for said thin-layer LED chip,

wherein said structure comprises protuberances that are largely periodically arranged,

wherein said protuberances are convexly curved as viewed from the outside,

wherein said glass material is a spin-on glass, and

wherein the height of said protuberances in the direction away from said radiation extraction surface is smaller than one wavelength of an electromagnetic radiation emitted from said epitaxial layer sequence.

Regarding claim 7, the formation of prior art's LED chip is necessitated by the processing steps recited in claim 7.

Regarding claims 8-13, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to fabricate said layer by applying a still-molten spin-on glass to said radiation extraction surface and thermally treating said spin-on

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glass such that it hardens and densities, wherein the spin-on glass is applied by spin-coating and/or printing, wherein said structure is introduced into said layer by grayscale lithography, wherein-said structure is introduced in such fashion that it comprises periodically arranged protuberances, wherein-the refractive index of said layer lies between the refractive index of a material of a side of said epitaxial layer sequence facing toward said radiation extraction surface and the refractive index of a medium intended as an ambient for said thin layer LED chip, wherein said structure is introduced in such fashion that the height of said protuberances in the direction away from said radiation extraction surface is smaller than one wavelength of an electromagnetic radiation emitted from said epitaxial layer sequence, in prior art's device in order simplify the processing steps of making the device by using conventional processing steps.

Regarding claims 2-6, prior art's device includes said structure comprises protuberances that are largely periodically arranged,

wherein the structure of the structured layer is such that the index of refraction of the structured layer transitions smoothly from the index of refraction of an unstructured region of the structured layer to an index of refraction of an ambient medium next to the structured layer,

wherein a width and a spacing of mutually adjacent protuberances is less than one wavelength of the electromagnetic radiation emitted from the epitaxial layer sequence, wherein the spin-on-glass contains silicon oxide,

wherein the radiation extraction surface has depressions and the structured layer fills the depressions, and

wherein the depressions are provided for homogenization of the electromagnetic radiation.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-19 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ori Nadav whose telephone number is 571-272-1660. The examiner can normally be reached between the hours of 7 AM to 4 PM (Eastern Standard Time) Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne Gurley can be reached on 571-272-4670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

O.N.  
12/2/2008

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